

Review 3.13-3.18

Name _____ Date _____ Period _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the component form and magnitude of the indicated vector.

- 1) Given that $P = (-2, 7)$ and $Q = (-4, -2)$, find the component form and magnitude of the vector $3\overrightarrow{PQ}$. 1) _____

Find the component form of the indicated vector.

- 2) Let $u = \langle -7, 1 \rangle$, $v = \langle 8, 3 \rangle$. Find $v - u$. 2) _____

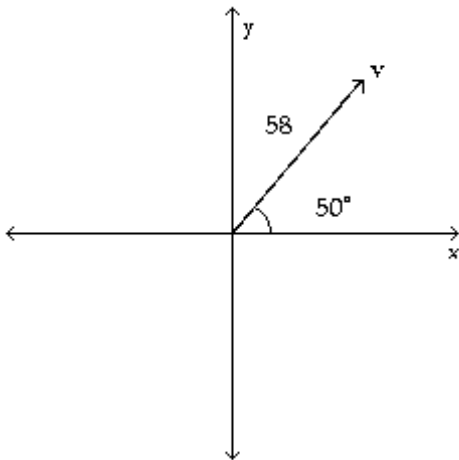
- 3) Let $u = \langle 8, -4 \rangle$, $v = \langle -1, 2 \rangle$. Find $2u - v$. 3) _____

Find the unit vector in the direction of the given vector. Write your answer in the indicated form.

- 4) Let $u = \langle 3, 4 \rangle$. Find the unit vector in the direction of u , and write your answer in component form. 4) _____

Find the component form of the vector v .

- 5) 5) _____



Find the magnitude and direction angle for the following vector. Give the direction angle as an angle in $[0^\circ, 360^\circ)$ rounded to the nearest tenth.

- 6) $\langle -2, -7 \rangle$ 6) _____

Solve the problem.

- 7) An airplane flies on a compass heading of 90.0° at 220 mph. The wind affecting the plane is blowing with a bearing of 321° at 48.0 mph. What is the true course and ground speed of the airplane? Round results to an appropriate number of significant digits.

7) _____

Find a \cdot b.

8) $a = \langle 4, 1 \rangle$, $b = \langle 3, -2 \rangle$

8) _____

Use the dot product to find $|v|$.

9) $v = \langle -6, 1 \rangle$

9) _____

Find the angle between the given vectors to the nearest tenth of a degree.

10) $u = \langle 6, 3 \rangle$, $v = \langle -5, -3 \rangle$

10) _____

11) $u = i + \sqrt{7}j$, $v = -i - 4j$

11) _____

Determine whether the vectors u and v are parallel, orthogonal, or neither.

12) $u = \langle 1, 6 \rangle$, $v = \langle 4, 24 \rangle$

12) _____

13) $u = \langle 6, 5 \rangle$, $v = \langle -5, 2 \rangle$

13) _____

Eliminate the parameter.

14) $x = t + 4$, $y = t^2$

14) _____

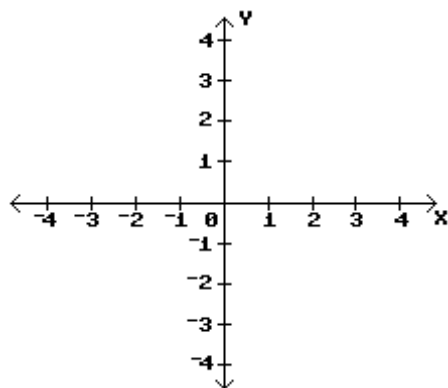
Find the rectangular coordinates of the point with the given polar coordinates.

15) $(-4, -\pi/3)$

15) _____

Plot the point with the given polar coordinates.

16) $\left(-2, \frac{\pi}{4}\right)$



16) _____

Determine two pairs of polar coordinates for the point with $0^\circ \leq \theta < 360^\circ$.

17) $(2\sqrt{3}, 6)$

17) _____

Find an equivalent equation in rectangular coordinates.

18) $r = 10 \sin \theta$

18) _____

19) $r = \cos \theta$

19) _____

Express the complex number in trigonometric form.

20) 2

20) _____

Write the complex number in the form $a + bi$.

21) $8(\cos 30^\circ + i \sin 30^\circ)$

21) _____

Find the product or quotient, as indicated. Leave your answer in trigonometric form.

22) Find the product of z_1 and z_2 .

$z_1 = 7(\cos 70^\circ + i \sin 70^\circ)$, $z_2 = 5(\cos 155^\circ + i \sin 155^\circ)$

22) _____

23) Find the quotient.

$$\frac{7(\cos 40^\circ + i \sin 40^\circ)}{4(\cos 295^\circ + i \sin 295^\circ)}$$

23) _____

Find the product or quotient. Write the answer in standard form.

24) $(3 - 7i)(8 + 3i)$

24) _____

25) $\frac{8 + 6i}{4 - 2i}$

25) _____

Use De Moivre's Theorem to find the indicated power of the complex number. Write your answer in standard form $a + bi$.

26) $(2 - 2i)^5$

26) _____

Find the indicated roots. Write the answer in $a + bi$ form.

27) Cube roots of 8

27) _____

Find the indicated roots. Write the answer in trigonometric form.

28) Cube roots of $8(\cos 243^\circ + i \sin 243^\circ)$

28) _____

Provide an appropriate response.

29) Determine whether each statement below is true or false. If either statement is false, provide a counterexample.

- If two vectors are perpendicular, then their dot product must be zero.
- If two vectors are orthogonal, then they must also be perpendicular.

Solve the problem.

30) The locations, given in polar coordinates, of two ships are $(7 \text{ mi}, 44^\circ)$ and $(8 \text{ mi}, 104^\circ)$. Find the distance between the two ships.